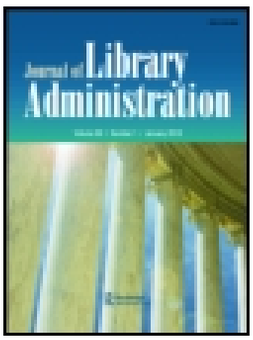

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# The Research Lifecycle as a Strategic Roadmap

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**ABSTRACT.** *What is the role and purpose of the academic library in the 21st century? Increasingly, this question is being asked on campuses around the country. The thesis of this article is that academic libraries will continue to play a vital role on campus, provided they align their services to the research and discovery missions of their respective institutions. If this is true, a clear definition of the research lifecycle now becomes a strategy roadmap, allowing academic libraries to see the bigger picture as well as the sweep of research services they might offer. The case for crafting the library's strategic plan around the research lifecycle is presented in four parts in this article. In part one, a review of the literature is presented, specifically that having to do with the continuing imperative of academic libraries to practice strategic alignment. An exploration of the increasing importance of the research experience in higher education is then presented in part two, followed by a detailed look at the research lifecycle. And finally, an overview of strategic opportunities and partners is presented in a final section.*

*KEYWORDS academic libraries, strategic planning, research lifecycle, research services*



## THE IMPERATIVE OF STRATEGIC ALIGNMENT

In a recent opinion piece for the Washington Post, Janet Napolitano (2015) contends that higher education is not in a crisis. Rather, "it is in motion, and it always has been." The underlying problem, in her opinion, is the increasing disinvestment in higher education that has taken place since the great recession of 2008 began. "44 out of 50 state governments have cut


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Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/wjla.

funding on a per student basis to their public institutions of higher education." Interestingly, Napolitano undercuts her own argument. By her own admission, higher education is in a serious funding crisis unlike any other. And outside of public education, the situation is just as difficult. At the center of this financial maelstrom, academic libraries are struggling to articulate a compelling strategic value proposition.

Menchaca (2014) recounts a recent conversation with a senior-level academic library administrator who admits that libraries are one of the university's top cost centers. His friend then continues, "Imagine the moment when the provost asks the library dean or director what the library has returned to the university for that investment. The answer isn't easy to come by" (p. 353). Kolowich (2012) confirms that academic libraries are not faring well in this new competitive landscape. In an *Inside Higher Ed* report, he writes, "Funds allocated to academic libraries shrank for the 14th straight year in 2009, dipping below 2 percent for the first time."

If anything, financial exigencies heighten the importance of strategic planning and alignment. When an academic library directly links its goals to those of the larger college or university, it is said to be strategically aligned. If, for example, a university has as one of its strategic goals to improve first-year retention, then a library might align itself to that goal by staging a pancake breakfast for freshmen during mid-terms, offering periodic game nights, or engaging in a variety of other student retention activities.

The case for strategic alignment is well-developed in the literature. Dillon (2008), for instance, argues that "libraries cannot thrive without aligning their workings directly to the core mission of their host institutions" (p. 57). Matarazzo and Pearlstein (2015) take a slightly more expansive view, arguing that the twin imperatives of strategic alignment and information literacy ought to be linked to the parent organization's objectives and goals. In their opinion, this is the first priority. Anderson (2014) offers similar advice in a column entitled, *Being Essential is not Enough*. In the first takeaway lesson, he urges academic libraries to "map (their) programs and services to the mission of the university and you will be seen as an essential academic partner, not just another piece of costly infrastructure" (para. 3).

A few libraries have already taken immediate and practical steps to ensure that they are properly aligned to their institution's strategic priorities. Brinley Franklin (2009), for example, describes a major restructuring which occurred at the University of Connecticut (UConn) libraries, undertaken with the intent of aligning them more closely to the campus academic plan. In this case, the UConn libraries assumed a proactive stance, heeding the call of Dillon (2008) and Jakubs (2008) to justify the often-substantial investment made in academic libraries. Franklin quotes both authors at the start of his article, and the advice from Jakubs (2008) is worth repeating. She writes, "Libraries must continue to prove their value to the university and demonstrate the

very significant investment not only in our buildings, staff, and collections, but also in the academic success of students and faculty" (p. 238).

Academic libraries that fail to demonstrate their value, that fail to align their priorities to the goals and objectives of their host institutions, face possible extinction. Even the largest and most prestigious libraries are not immune. In a *Harvard Crimson* article from a few years ago, Rouse and Worland (2012) report on the fear and uncertainty related to Harvard's plan to both restructure and downsize its libraries. At that time, a quarter of the library's workforce was offered buyouts (Kelley, Schwartz & Lee, 2012).

Academic administrators find it difficult to justify ongoing library investments when usage fades and the link between the library's mission and that of the university remains undefined. Woodward (2009) captures the predicament of administrators when she writes, "When they (administrators) enter a library that is filled with endless stack ranges but nearly empty of students, they see valuable real estate that could be better used" (p. ix). In addition to real estate, they also see budgets ripe for cutting. As early as 2001, Carlson (2001) was raising concerns about "the deserted library," bereft of students and largely disconnected from its educational context. And a couple years later, Martell (2005) noted that "declines in the number of circulation, reserve, in-house, and reference transactions are deeper and more widespread than generally recognized. Are the declines likely to continue? Probably yes" (p. 444). From this, it is clear that utilization continues to be a key indicator of a library's strategic alignment to the university's overarching mission.



## THE RESEARCH EXPERIENCE AS STRATEGIC PRIORITY

The message of the previous section can be summarized as follows: In a time when budgets are shrinking or static, academic libraries ought to practice strategic alignment. That is, they should align their services and resources in support of their parent organization's strategic goals. Furthermore, those libraries that fail to do so—that fail to articulate a compelling return-on-investment—face possible extinction. Yet this presents a problem in that modern colleges and universities are complex organizations, beholden to a wide spectrum of interest groups and constituents. Thus it is not uncommon for an institution to be pursuing multiple strategic goals. So which goal should the academic library align to and support?

One way to answer that question is to ask another. Why were colleges and universities created in the first place? The answer is remarkably simple. Universities and colleges were created to educate students and discover new knowledge. And the discovery of new knowledge is the result of conducting research. Hence, academic libraries can play a strategic role by supporting all

facets of the research function. This simple prescription is similar in spirit to Dillon's (2008) vision of the library as an "accelerator of discovery," acting as a booster that launches students and faculty on their trajectories of discovery (p. 54). Unfortunately, he does not specify what research services will turn the library into a research accelerator. That task is left to others, but it is one that will be taken up later in this article.

Like Dillon, Stamatoplos (2009) sees the research experience as becoming strategic and much more prevalent on American campuses. In an article on the rise of the mentored undergraduate research experience, Stamatoplos writes, "Undergraduate research is emerging rapidly as a valued pedagogy in higher education ... Because it is an experiential form of learning, campuses are recognizing undergraduate research as an important recruitment and retention tool" (p. 235). Obviously, this has profound implications for academic libraries. The research experience is now being given its pedagogical due, creating a strategic opportunity for those academic libraries that can fully support it. Research has long been the academic library's core competency, and now that competency has been directly linked to strategic issues at the executive level; namely, as a selling point for prospective students.

Later in his article, however, Stamatoplos (2009) points out that the undergraduate research experience and the subsequent strategic opportunities it creates are rarely mentioned in the library and information science (LIS) literature. Indeed, the "literature effectively reduces the research of undergraduate students to processes of finding information and using information sources" (p. 239). The situation is no better in discipline-specific evaluative studies of research programs in which the contribution of libraries and information professionals "is virtually absent" and information literacy is "either assumed or ignored" (p. 239). It is clear that academic libraries have yet to fully understand and take advantage of the strategic possibilities inherent in the academic research enterprise.

The increasing importance of research in higher education prompted Lewis (2007) to urge librarians to embed the academic library into the research enterprise. Indeed, he develops a five-part strategy to keep the academic library "a vibrant enterprise worthy of support from our campuses" (p. 420). His first three recommendations focus on the broader implications of electronic resources—make the transition from print to electronic formats, retire legacy print collections, and then use the newly freed space to position the library as the "primary informal learning space on campus" (p. 420). His last two recommendations are as follows: "Reposition library tools, resources, and expertise so that they are embedded into the teaching, learning, and research enterprise ... migrate the focus of collections from purchasing materials to curating content" (p. 420). Because Lewis (2007) lays out a rather comprehensive strategic plan, his line of thought deserves extended treatment.

Overall, Lewis makes a strong argument. Academic libraries need to get out of the paper business as soon as possible. Rush Miller (2012) agrees when he writes, "Legacy collections, those wonderful book collections that number in the millions at ARL libraries, are not yet an albatross hanging around our necks, but they are less and less important in determining our effectiveness" (p. 14). Clearly, then, doing something with the paper albatross is a necessary first step. Embedding resources and services into the research enterprise is precisely what academic libraries should be doing, given the increasing importance of the research experience in higher education settings (Stamatoplos, 2009).

The strategic approach advocated by Lewis (2007) is largely sound, though his final piece of advice raises concerns. First off, Lewis does not clarify what he means by curation. One Internet source defines digital curation as "the selection, preservation, maintenance, collection, and archiving of digital assets" (Digital Curation, para 1). If this is how Lewis defines curation, then it is no different from what librarians do in the paper world; all that has changed is the medium. More importantly, academic libraries risk a similar outcome, only this time it will be millions of digital artifacts that are rarely, if ever, accessed. At least they will not be gathering dust on the shelves. The carrying cost per artifact may be lower for electronic resources, but the up-front costs of creating these massive collections puts academic libraries at a distinct disadvantage in the competition for academic funding. The problem is that digital artifacts do not come with a quantifiable return on investment. Who knows? An academic library might invest thousands to roll out a digital archive, only to discover that no one uses it.

Lewis (2007) rightly contends that academic libraries need to divest themselves of their large paper holdings. Traditional collection development, in his opinion, is out. Rather, libraries ought to shift their focus to digital curation activities. But if clients no longer find the library's carefully crafted paper collections to be of value, why would they find an electronic equivalent to be any more useful? Lewis (2007) admits that most students and faculty now use Google instead of the library's vetted information resources. In fact, he quotes studies that show that this is indeed the case. The problem with the curation and collection development mindset is that librarians end up making decisions about what is to be collected or digitized in the hope that the items will be utilized at some point in the future. Money that was once spent buying paper is now redirected toward digitizing and curating electronic content.

The problem lies in the fact that whether one is building a paper collection or an electronic one, librarians are still making investment decisions based largely on what they sense has value. In other words, digital curation is no better than the collection development mindset that preceded it. The two are essentially equivalent. In both cases, a monetary investment of some sort is required. In fact, digital curation is often a more expensive

than outright purchase of a physical item, and both mediums require an ongoing investment. Re-shelving may not be an issue in the electronic world, but hardware and software systems must be upgraded from time to time and continuous monitoring is also essential. Unlike publishers, libraries have yet to develop a sustainable economic model for this new curation role. Large digitization projects are often paid for through grants or donations. Ongoing support costs, on the other hand, remain problematic. The new institutional repository where all the digital artifacts are stored, for example, has either a yearly subscription or an ongoing maintenance cost linked to it.

The traditional linkage between research and collection size, electronic or paper, has been broken in this new era of networked knowledge resources. Lewis (2007) does not appear to recognize the full implications of this development as he continues to place undue emphasis on the continuance of a collection-building mindset (paper or electronic) which ought to be redirected toward research services. In other words, his recommendation five should state, "Migrate the focus of collections from purchasing materials to curating content [as driven by research priorities]" (p. 420). In this revised statement, curation activities are directly linked to and driven by what researchers need, not something the library does in a vacuum.

## THE RESEARCH LIFECYCLE

The argument up to this point has established the following. First, academic libraries ought to practice strategic alignment by making direct, tangible contributions to their host institution's strategic goals. Second, research is becoming a strategic priority on many campuses because it attracts students and contributes to retention. In short, academic libraries now face an historic opportunity to play a strategic role in higher education by taking up the research standard. But what research services should the academic library offer?

Before the question of service offerings can be answered, though, a key misconception must be dealt with, namely, the idea that information literacy is equivalent to research. Many academic libraries have responded to the research opportunity by playing up their information-literacy initiatives. Matarazzo and Pearlstein, for example, view this as a viable long-term strategy. However, these two authors conflate research with information literacy, believing that the rise of research raises the importance of information-literacy initiatives. What Matarazzo and Pearlstein (2015) fail to recognize is that information literacy is but one small piece of the total research puzzle. Rather than information literacy, academic libraries ought to focus instead on supporting the holistic research experience, something altogether different.

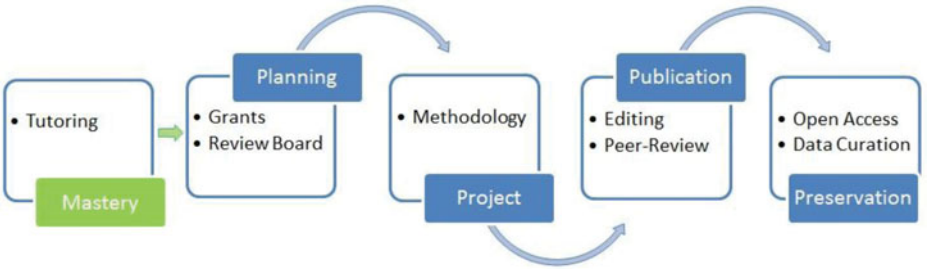


**FIGURE 1** Cycles in the research lifecycle.



Matarazzo and Pearlstein (2015) are correct to argue that the "academic library's ability to directly link student information literacy training to learning outcomes and further to employability beyond graduation, is critical to sustainability" (p. 9). They fail to recognize, however, that the research experience is what the market values, not just a slice of it in the form of information literacy. Stamatoplos (2009) makes a similar point when he notes that many academic librarians wrongly "equate student research with processes of information searching" (p. 236). Genuine research experiences, he continues, "entail real hands-on experience in research conception, design, conduct, and dissemination and make inherent contributions to a discipline" (p. 236). In other words, research is about much more than finding and evaluating knowledge sources, the traditional focus of information-literacy initiatives. Research is about asking questions, about synthesizing ideas, and about creative problem solving. These are the skills valued by employers. Clearly, being able to assess the quality of the information one has at hand (information literacy) is a necessary skill, but it is insufficient, in and of itself, to justify the existence of today's academic library. Instead, libraries should provide services at multiple points along the research lifecycle. In fact, the research lifecycle ought to drive the library's response to the question, "What should we do?"

In this approach to strategy, the research lifecycle becomes the primary driver of the academic library's strategic planning process, informing all of its decisions. A more complete understanding of the research lifecycle is therefore in order before moving on to a discussion of specific research-services offerings. As depicted in Figure 1, the research lifecycle consists of four primary cycles—planning, project, publication, and digital preservation. Actually, this particular model is based on one developed by the University of Central Florida Libraries Research Lifecycle Committee (2012) which, in turn, is an enlargement of Open WetWare's research lifecycle. A number of other organizations have defined research lifecycles, including Oracle, the University of Virginia, the University of Bath, the Digital Curation Center, the

UKDRN, and others. Unfortunately, an in-depth comparison of these various research lifecycles is beyond the scope of this paper.

## The Mastery Cycle

At the outset, it should be noted that the research lifecycle assumes a certain level of mastery on the part of anyone who initiates an inquiry. Indeed, a content-mastery cycle precedes that of the four research cycles. To ask a question presupposes adequate knowledge of a discipline to formulate it. Hence, the academic library should provide services and spaces which support content mastery in each of the disciplines. Reading is probably the most important and basic skill of the mastery cycle. Each discipline has a unique vocabulary, a core set of knowledge artifacts its practitioners must value and master. The library can assist students in acquiring not only a specialized vocabulary but also in improving reading speed and comprehension rates, through the judicious use of software and tutoring services.

In addition to reading, thinking and writing skills must also be acquired in the mastery cycle. The ability to clearly express oneself in writing is an indicator of thinking ability and skill. In most of the disciplines, practitioners adhere to specific models in their communications with each other. For example, there is a specific way in which biologists present their findings in a peer-reviewed journal. Academic libraries can offer research services that assist students in mastering not only the basics of spelling, grammar, and punctuation but also the fundamental forms of communication in their respective disciplines. In many cases, an acceptable form has been codified in a manual, e.g., the APA and MLA style guides. Many colleges and universities have started writing centers in recent years. It makes obvious strategic sense for the academic library to offer space for such entities or to begin offering these kinds of services if they do not already exist on campus.

Studies suggest that mastery is enhanced through teaching others, through hands-on learning and concept acquisition. Thus peer tutoring is an essential component of an academic library strategy driven by the research lifecycle. Student employees are more affordable than faculty, and they are often more effective too (Bodemer, 2014). The chance to mentor first- and second-year students also benefits the tutor in that it reinforces concepts they learned when they first sought to join a community of practice. In fact, the peer-tutoring system itself becomes a community of practice that specializes in mentoring and teaching.

## The Planning Cycle

Once a conceptual foundation is in place, a researcher (student or faculty member) is now in a position to ask questions, to consider new ideas. A

research project usually commences with a literature review. Of course, research and reference services have been the bread-and-butter business of academic libraries for a long time now. What is relatively new, on the other hand, is the array of citation management tools now available—Refworks and Endnote being two of the largest players in this space. The automation of bibliographic work creates additional strategic opportunities for the academic library to provide consultation and training in the proper use of these tools.

It is in the planning cycle that the legal and ethical dimensions of a proposed research project are reviewed. To that end, institutional review boards (IRB) have been setup on most university campuses to provide ethical and legal oversight. The typical IRB workflow generates documents which require some form of management and oversight. And in some cases, the university IRB committee has the authority to fund projects as well. The academic library's relationship to the IRB committee is therefore strategic, providing a window into research projects across campus. With this knowledge, the library is in a position to proactively reach out to potential clients as well as provide logistical support for the IRB workflow.

The size and scope of a research project may require external funding, and the planning cycle is where grant options are explored. At many colleges and universities, grant-writing is part of the advancement office. However, many smaller colleges and universities have yet to develop a grant-writing capacity, creating another strategic service opening for the academic library. In cases where this function already exists on campus, the library can still assist in the discovery of potential donor organizations.

Once research funding is obtained, most granting organizations require accountability for how monies are being spent, through the filing of regular reports. Since 2011, the National Science Foundation (NSF) has mandated that all funding proposals provide a data management plan (National Science Foundation, 2011). This requirement has created opportunities for academic libraries to not only assist in the creation of these plans but to also offer data curation services. In summary, funded research creates a range of support opportunities for the library.

## The Project Cycle

Out of the planning cycle, either a complete or initial research proposal emerges. That proposal is then executed during the project cycle. The experiment is conducted, primary sources consulted, and field observations made. Data sets and notes are usually generated during this cycle. Although university or college faculty oversee most of the activity during this part of the research lifecycle, academic libraries can still play an important strategic role, connecting investigators to specialists such as statisticians and others

with specific methodological expertise. In addition, libraries can offer training classes on the specifics of note-taking and appropriate software tools, such as EverNote, which support this activity. And of course, large datasets and extensive notes need to be organized in some way, with appropriate metadata (tags and headings) assigned with the assistance of academic librarians.

## The Publication Cycle

After executing a project, the researcher writes up the findings in this cycle. The strategic service opportunity here is in the writing and editing of the emerging paper or article. In a few cases, the campus writing center is fully integrated into the academic library's organizational and operational structure. That is the case where this author works. In those cases where it is a distinct campus entity, the academic library will want to forge a strategic partnership with the writing center. A library/writing center combination is the perfect venue for hosting writing workshops as well as educating authors regarding their publishing options and intellectual property rights. The academic library can also play a strategic role in the setup and ongoing management of peer-review networks, especially in those cases where a library software product automates this function. For example, Digital Commons from Bepress provides support for managing peer-review processes.

With the rise of electronic publishing, many large academic libraries have begun to move aggressively into the publishing space, in some cases assuming direct oversight of the university press. This too is a smart strategic move, similar to the creation of a partnership between the library and the university writing center. The end result is a full-spectrum strategy in which the academic library plays a key role (either as partner or provider) in the research lifecycle, from idea origination to final publication in an electronic book or journal.

## The Electronic Preservation Cycle

This final cycle is where the university's scholarly output is preserved and disseminated. Within it, the academic library assumes a larger role as it often provides the underlying research infrastructure to carry out these functions. Academic libraries frequently employ institutional repositories and other open access software platforms to fulfill this strategic function. Meta-data services are vitally important at this point, creating the maximum exposure for the university's scholarship. Of equal importance is the library's data curation expertise as datasets are the knowledge backbone of multi-year research projects. Securing data and making it available

**TABLE 1** Strategic Opportunities and Partners

| Cycle | Opportunity | Possible Partner |
|---|---|---|
| Mastery | Reading and Writing | Writing Center |
| | Peer Tutoring | Learning Support Services |
| Planning | Research and Reference | |
| | Citation Management | |
| | Legal and Ethical Compliance | Institutional Review Board (IRB) |
| | Grant Acquisition and Management | Advancement |
| Project | Research Tools and Methods | |
| | Observation and Note-taking | |
| Publication | Writing and Editing | Writing Center |
| | Peer-Review Setup and Management | |
| | Marketing | Research and Dissemination |
| ePreservation | Meta-Data Support | |
| | Open-Access Publishing | |
| | Data Curation | |



over extended periods of time is strategic to any research enterprise or endeavor.

## PUTTING ALL THE PIECES TOGETHER

The overview of the research lifecycle provided in the previous section highlights a variety of strategic library services and partnerships. A summary of those opportunities are listed in Table 1, grouped by cycle.

As evident from Table 1, the research lifecycle is actually a strategic roadmap, a quick way of validating the academic library's journey to strategic relevance and alignment. Research services not yet provided thus become strategic opportunities. In those cases where another department on campus already provides a particular service, the library can develop a strategic partnership. Thus the research lifecycle not only highlights what the library ought to do, what services it ought to offer, but it also identifies potential partners.

In many ways, the approach to strategy formulation advanced in this paper is a return to a foundational understanding of the academic library. Academic libraries have long stood as places of research. That was the primary reason they were created in the first place. The only difference today is that technology has dramatically broadened the scope of opportunities and possibilities. And now that the research experience is becoming a strategic priority in higher education, academic libraries face an historic and unprecedented opportunity—the chance to be strategically

aligned and significant and to become, once again, the intellectual heart of campus.

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